

NEWS REPORT

NATIONAL ACADEMY OF SCIENCES NATIONAL RESEARCH COUNCIL



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NEWS REPORT

National Academy of Sciences National Research Council

VOLUME XI

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Tenth Pacific Science Congress

HAROLD J. COOLIDGE

Executive Director, Pacific Science Board

FROM all points of the compass scientists concerned with work in the Pacific area flew into Honolulu, Hawaii, to attend the Tenth Pacific Science Congress of the Pacific Science Association from August 21 to September 6, 1961, which was sponsored by the National Academy of Sciences and Bernice P. Bishop Museum in cooperation with the University of Hawaii. Most of the meetings were held at the University, with the opening and closing plenary sessions in Andrews Amphitheater on the campus.

The Honorable William F. Quinn, Governor of Hawaii, welcomed the delegates on behalf of the State, Dr. Laurence H. Snyder, President of both the Congress and the University, described the central goal of the meeting as being "to promote the well being of, and peace among, the Pacific peoples," and Dr. Roger R. Revelle represented Dr. Jerome B. Wiesner, Special Assistant for Science and Technology, who was to have been President Kennedy's personal representative at the Congress but was unable to attend because of illness. Dr. Revelle extended greetings to the delegates by reading a message from the President in which he said:

Your meeting represents so much that I and this nation believe to be important; the joining together of people to solve common problems; the free and

open communication of ideas and discoveries; the importance of science to the betterment of man in all countries and in all walks of life; and the peaceful application of the results of man's aspirations to learn more about his world. With these in mind, it would have been a great privilege for me to be able to greet you in person today and offer to you my country's hospitality.

The Congress was attended by 2,654 members and auditors from 66 countries and territories. Although the United States had the largest attendance, the following countries had more than 20 delegates each: Australia (83), Canada (63), India (24), Indonesia (33), Japan (149), Korea (25), New Zealand (52), The Philippines (60), Taiwan (46), Thailand (43), Union of Soviet Socialist Republics (52), and the United Kingdom (24).

The attendance represents a considerable growth since the Congresses were founded in 1921 by a meeting in Iolani Palace in Honolulu attended by 103 delegates from the United States and eight foreign countries. Seven delegates of that first Congress still reside in Honolulu, and they were special honor guests at the plenary sessions, as was Mrs. Herbert E. Gregory, the widow of the Congress founder. The Bishop Museum Trustees recently established the Herbert E. Gregory Medal for distinguished service to science in the Pacific to honor

the achievements of Dr. Gregory, and the first award was presented at the opening plenary session to Professor A. P. Elkin of Australia, an anthropologist noted for his own research and for his contribution to the development of institutions conducting research programs in the Pacific.

After the opening session the delegates separated for the formal scientific meetings in the following nine sections of the Congress—Agricultural Sciences, Anthropology and Social Sciences, Biological Sciences, Conservation, Forestry, Geography, Geophysical Sciences, Public Health and Medical Sciences, and Scientific Information. Some of the scheduled symposia were of interest to several disciplines, and many delegates felt that part of the success of the Congress program was due to the stimulating effect these interdisciplinary symposia had on discussions of diverse problems. The following examples are cited: Matthew Fontaine Maury Memorial Symposium, Man's Place in the Island Ecosystem, Pacific Basin Biogeography, and Galapagos Islands: A Unique Area for Scientific Investigation.

The Antarctic symposium honored the memory of Matthew Fontaine Maury, the American naval officer who proposed an international program of Antarctic research over one hundred years ago. The 24 papers by scientists in the IGY and post-IGY field programs and research activities gave authority to the stimulating and fruitful international review of Antarctic work that ranged from upper atmosphere to marine geology and bottom sediments. Of special interest was the discussion on the connection between fish distribution and a noted oceanographic phenomenon, the Antarctic Convergence. It was pointed out that further study of this circumpolar oceanic "front" and its strong westerly current is needed over a cooperative long-term synoptic observational period to better understand its rather fixed geographical location and the possible existence of waves and vortices similar to those found in the atmospheric westerly jet-streams.

The ecosystem—all factors affecting a system—and some of its potentialities were discussed in the symposium on Man's Place in the Island Ecosystem, which was spon-

sored by UNESCO. Several papers described the geography and nature of the physical and biological components of the island ecosystem; others explored the philosophical and practical bases of the relationship between man and nature and discussed the manifestations of these on islands. The rapid changes in previously relatively stable or only slowly changing island cultures, brought about by European contacts, social influences, and technological advance, and their ecological consequences were considered. The outstanding accomplishment of the symposium was the clarification of some of the philosophical approaches to man's relationship with nature, and suggestions for fruitful lines of future research. These may improve our understanding of the functioning of the world ecosystem and man's influence on it through the use of the island as a microcosm or model.

The Pacific Basin Biogeography symposium brought together many outstanding zoologists, botanists, and geologists, and the problem of the spread of organisms around and into the Pacific Basin was approached from three aspects: Bering Arc, Tropical, and Antarctic Relationships. The data of geophysics, oceanography, paleontology, and ecology are of great significance in this field, and the meeting provided biogeographers with a rare opportunity to listen to the ideas of specialists in these fields and to the review of data from these other areas specially assembled and arranged for the use of biogeography. An excellent review of Pacific paleogeography and a summary of the geological and geophysical facts bearing on it provided the background for discussions on the other papers. The papers and discussions indicated that answers are being obtained to questions that are basic to the whole field of biogeography, and the positive evidence of submarine mountain ranges and changes in sea level open new horizons for research in biogeography.

A popular lecture and film on the Galapagos Islands served as a general introduction for this two-day inter-disciplinary symposium. The papers and discussions covered work already done and explored the possibilities for future scientific studies that might be carried out at the international research laboratory being established by the

Charles Darwin Foundation for the Galapagos Isles. Because of the need to preserve the unique animals and plants of the Galapagos Islands and the need for complete biological studies of these organisms before further extinction and deterioration takes place, a resolution urging all governments interested in basic scientific research to support the program of the Charles Darwin Foundation for study and strict conservation in the area was adopted.

The meetings of the nine sections of the Congress covered a wide variety of subjects, and the following paragraphs cite some of the subjects and discussions in these sessions.

Archaeologists meeting at the Congress agreed to form a preliminary organization for archaeological work in the Pacific area and developed a general plan for international archaeological reconnaissance and excavation in the Pacific. A committee was set up to implement this plan and to coordinate the activities of the present and future participants.

Linguistic papers covered a wide variety of subjects on both Malayopolynesian and non-Malayopolynesian languages, and problems in genetic classification were the focus of interest because of their implications for the history of the area. Resolutions were passed advocating a modest periodical in Pacific linguistics (some financing for this has subsequently been received), encouraging summer courses in the field, fostering the expansion of research in Melanesia, and for assisting in every possible way institutions of the new nations of Southeast Asia wishing to make linguistic surveys.

Demography and demographic interrelations permeated many sections of the Congress; geography, public health, and nutrition were all concerned with population processes and problems. The session on Hawaii as a social science laboratory offered a model for future organizers in the emphasis on social structure and process among the host people.

The Congress provided an opportunity for several anthropologists interested in the New Guinea area to discuss plans for future research there. The New Guinea-Melanesian area, one of the few remaining Pacific localities with societies relatively unaf-

ected by foreign contact, is of increasing anthropological importance, and a resolution that anthropological research be encouraged to provide essential data on the operation of small, independent societies and to establish base lines for eventual long-range study of change under foreign contact, was adopted. An international committee to work on implementing the resolution was formed.

The Congress offered the first opportunity for the scientists of the Pacific area who are concerned with coconut research to discuss together the urgent need to improve coconut production not only in the Pacific region but in Southeast Asia, the Far East, and other regions of the world where the coconut is of paramount importance. Their discussions resulted in the adoption of a resolution requesting Food and Agriculture Organization (FAO) to initiate a taxonomic survey of *Cocos nucifera* L., to set up an international center for the control of coconut pests, to establish an international coconut bureau for the coordination of research and dissemination of technical information, and to compile a world register of coconut research workers and maintain a world list of coconut genetic stocks. The symposium on rice problems stressed the importance of international cooperation in fundamental research on the origin of rice, particularly the unification of symbols, taxonomic description, collection and maintenance of herbarium specimens, and the shortage of seed and cytogenetic material. FAO and the International Rice Research Institute were requested to take all possible steps to implement these projects.

For the first time the Congress included a section on forestry. Emphasis in all the symposia was on problem formulation and research methodology rather than on substantive findings, and the program was related to the developmental needs of the Pacific region on topics which moved from the regeneration of forests through management and wood technology to the final stage of development of marketable forest products.

Trends reflected by meetings in the section on public health and medical sciences indicated the growing realization that disease is definitely part of man's culture and

way of life, and the practice of medicine must pay more attention to the consequences of what it does. Increased emphasis must be placed on health education, which is so essential in preventive medicine, and one of the best ways to accomplish this is through development of rural health centers for education at that level. The discussions on medical education emphasized that this must be adapted more to the local needs within countries, and that premedical training of doctors should be undertaken in their own countries, or countries with similar medical problems.

Another symposium revealed that disease eradication schemes must now take into consideration new findings in the fields of zoonoses, such as the discovery of Malayan filariasis in domestic animals, monkey malaria in man, influenza in a host of animals from pigs to ducks, and such questions as whether rabies in bats may be an increasing epizootic.

Another section new to the Pacific Science Congresses was that on scientific information, and meetings of this section brought together specialists from many countries to discuss the education and training of librarians and science information specialists; the provisions of cooperative bibliographic tools and library services to make the existing world resources available whenever possible directly to the scientists; the orderly primary publication of research results in each country; the increased cooperation in indexing and abstracting; and the expansion and improvement of information resources necessary to the expanding research and development activities. Resolutions were adopted for the improvement of scientific information activities in the Pacific area in an endeavor to create a continuing machinery for developing adequate information services for Pacific scientists.

Because of the importance of tsunamis in the Pacific area, a symposium on this subject was planned early in the organization of the Congress, and a number of extra meetings were added as a consequence of the heightened interest due to the disastrous effects of the May 1960 Chilean tsunami. Discussions indicated that probably

the most spectacular recent advances in the study of tsunamis have come in the determination of the nature and configuration of tectonic crustal displacements from seismographic evidence. While these were considered the usual cause of large tsunamis, evidence showed that other causes may be involved that are at least locally destructive, such as submarine slumping, for example. Even the direct coupling of long-period seismic waves in the crust was considered as a possible origin.

The Congress recommended the establishment of a tsunami data gathering system and the preparation of an annotated bibliography on tsunamis. Three warning systems are in operation in the Pacific, and the resolution recommended that consideration be given to developing an international system so that information can be shared more quickly and more completely among the warning centers.

Forty-six resolutions relating to actions that might be taken by governments, international organizations, and scientists to further certain aspects of science and conservation in Pacific countries were adopted by the Congress. A few of the resolutions urging action by international organizations have already been mentioned; some resolutions related to matters of concern to the State of Hawaii, such as the establishment of a tropical botanic garden and the protection of rare endemic species of Hawaiian birds; others were Pacific-wide and involved such matters as intensive studies of the milk fish (*Chanos chanos*) which is an important food fish throughout Southeast Asia, and the conservation and management of marine turtle populations.

To supplement the meetings the Congress program included visiting research vessels, scientific films, field trips, exhibits, public lectures and panel discussions, and four official receptions.

Research vessels displayed their equipment and held open house for Congress delegates. The ships included the U.S.S. *Marysville* from the Navy Electronics Laboratory, the *Vityaz* on which 52 Russian scientists travelled to the Congress, the *Argo* and *Baird* from Scripps Institution of Oceanography, the *Gascoyne* from Austra-

lia, the U.S.S. *Maury* and *Serrano* from the Navy Hydrographic Office, and the U.S.S. *Pioneer* from the Coast and Geodetic Survey. Scientists from the U.S.S. *Marysville* reported on their 17-day scientific voyage from San Diego to Honolulu, trolling for ocean temperature all along the 2,300-mile route and finding the irregular pattern of actual mountains and valleys of temperature instead of layers. Several scientists, including oceanographers and marine geologists from the *Vityaz*, were taken on a demonstration cruise on the *Argo* about 15 miles southwest of Honolulu to the edge of a narrow flat shelf at 200 fathoms. The edge of the highly fossiliferous shelf was dredged and typical, very shallow water reef fauna was recovered, which preliminary inspection has indicated is pre-Recent. Intercalibration tests in the fields of primary production and certain aspects of chemical oceanography were carried out on shore and at sea by the research vessels. The tests at sea by the *Vityaz*, *Argo*, and *Gascoyne* gave scientists an opportunity to demonstrate intercalibration techniques of several countries while working together on vessels from other countries.

Field trips to acquaint the visiting delegates with the scientific aspects of the host country have always been an integral part of Pacific Science Congresses. During the two weeks the meetings were in session, trips were made to scientific institutions, visiting research vessels, and various parts of the island to observe a variety of geological, climatological, botanical, and cultural features. At the close of the meetings more than 500 delegates participated in the field trips to the outer islands.

Other meetings were held at the time of the Congress by the Unesco Committee on Humid Tropics, the Tsunami Committee of the International Union of Geodesy and Geophysics, the Tsunami Panel of the World Meteorological Organization, the Pacific Tuna Biology Conference, the International Geographical Union's Commission on World Land Use Survey and Commission on the Humid Tropics, the South Pacific Commission's Urbanization Advisory Committee, the American Institute of Biological Sciences' Shark Research

Panel and Committee on Biological Sciences Communication Project, as well as the Committee on Oceanography of the National Academy of Sciences. The Congress offered virtually an unparalleled opportunity for scientists from countries participating in the International Indian Ocean Expedition to discuss planning and problems related to the expedition, since representatives of most of the participating nations were present.

It is believed that the Congress will be of lasting significance to the State of Hawaii and its scientific institutions. Many scientists took an active interest in the plans for the future development of the East-West Center of Cultural and Technical Interchange at the University of Hawaii, and offered to encourage scientists from their countries to study there. The Bishop Museum's research collections and field programs, as well as research laboratories of the University's Marine Station, the Pineapple Research Institute, the Hawaii Sugar Planters' Association Experiment Station, all attracted wide interest and will benefit from future cooperation with Congress delegates in many parts of the Pacific World as well as the United States mainland.

The intellectual isolation of scientists from under-developed countries, regardless of their scientific training, is reduced by their participation in international congresses. One of the most important benefits of the Congress, therefore, was the opportunity it afforded delegates from countries whose science is young to meet face to face with delegates from countries whose science is far advanced.

To organize the Congress the Executive Committee had the voluntary assistance of many scientists and individuals from the staff of the University of Hawaii, Bishop Museum, Pacific Science Board of the Academy-Research Council, and scientific institutions in Honolulu. Financial support was received from international, federal, state, and private sources, with extensive help from the National Science Foundation, National Institutes of Health, the U. S. Department of Defense, and the State of Hawaii.

To those who organized the Congress it seemed most fitting that the National Science Board should hold its meeting in Honolulu during the closing days of the Congress and that its Chairman, Detlev W. Bronk, the Honorary President of the Congress, should close the Congress with the

following memorable message:

In these dark days of world discord and rising barriers to free communication, a gathering such as this is a significant breach in the walls of silence that separate common people of goodwill * * *. Congresses such as this serve notice on statesmen that, through science, nations can peacefully gain those material benefits they have sought fruitlessly to acquire through war.

SCIENCE NEWS

INTERNATIONAL INSTITUTE OF REFRIGERATION

Detlev W. Bronk, President of the National Academy of Sciences, has invited the International Institute of Refrigeration (IIR) to hold the meetings of its Technical Board and appropriate Commissions at the Academy in August 1962. The meetings will be sponsored by the U. S. National Committee, IIR, under the chairmanship of Richard C. Jordan, University of Minnesota. W. T. Pentzer, U. S. Department of Agriculture, is serving as chairman of the Local Arrangements Committee.

In addition to the meetings of the Technical Board, the following Commissions will hold scientific and technical sessions: Commission II—Transfer of heat, thermal properties of materials, instrumentation, and insulating materials; Commission III—Design, construction and operation of machinery for refrigerating and air conditioning plants; parts of Commission IV—Applications of refrigeration to foodstuffs and agricultural produce; Commission VI—Applications of refrigeration excluding foodstuffs and agricultural produce; and Commission IX—Education.

The following members of the U. S. National Committee, IIR, are working with the Commission Presidents in preparing the technical part of the program:

C. M. ASHLEY, Carrier Corporation
B. H. JENNINGS, Technological Institute, Northwestern University
C. F. KAYAN, Columbia University
W. T. PENTZER, U.S. Department of Agriculture
W. R. WOOLRICH, University of Texas

Additional information regarding these meetings may be obtained from Mr. D. W. Thornhill, U. S. National Committee for IIR, Academy-Research Council.

CONFERENCE ON URBAN TRANSPORTATION RESEARCH

The Special Committee on Urban Transportation Research, under the chairmanship of Pyke Johnson, a consultant of the Division of Engineering and Industrial Research, held a two-day conference at the National Academy of Sciences on September 14 and 15 with some 60 urban researchers and administrators in attendance.

The purpose of the conference was to initiate action which would result in a publication of statements of important and urgent researchable problems in the urban transportation field. The immediate aim was to discuss the concepts, values, and measurements applicable to urban transportation as it affects and is affected by its environment and establish a framework for researchable questions or problems.

To accomplish this purpose the conference group was divided into five ad hoc task force panels to deal with the following major segments of the total problem area: 1) Changing land-use patterns, and the forms of the metropolitan areas of the future; 2) social structures of urban areas and personal desires; 3) economic development—industrial, retail, and other commercial activity, and their spatial arrangement; 4) urban development programs such as urban renewal, street and highway programs, etc.; and 5) political factors, such as forms of government and intergovernmental relationships, and the administration and financing of urban transportation.

On the second day of the conference the five panel chairmen reported that the substance of the previous day's deliberations was a better molded concept of the problems in each of the areas.

VISITING INTERNATIONAL SCIENTIST PROGRAM IN THE GEOSCIENCES

The American Geological Institute will conduct its third Visiting International Scientist Program during the current academic year beginning in January 1962. Five eminent scientists from abroad will participate in the program and will lecture for three months at graduate departments of geology and/or geophysics in colleges and universities throughout the United States.

The five visiting scientists and their home institutions are listed below:

STUART O. AGRELL, University of Cambridge, Cambridge, England

MARTIN F. GLAESSNER, University of Adelaide, Adelaide, South Australia

GEORG W. R. KNETSCH, University of Wurzburg, Wurzburg, Germany

MARIUS LECOMPTE, University of Louvain, Louvain, Belgium

ALWYN WILLIAMS, Queen's University of Belfast, Belfast, Northern Ireland

CONFERENCE ON ELECTRICAL INSULATION

The Conference on Electrical Insulation, sponsored by the Division of Engineering and Industrial Research, held its 30th annual meeting at Pocono Manor, Pa., October 23-25, 1961. One hundred and seventy-five members and visitors registered for the meeting.

A program of three invited papers and thirty contributed papers was presented. Roundtable discussions on D. C. conduction, dielectric breakdown, and fundamentals of dielectrics were also held.

The seventh Whitehead Memorial Lecture was given by Raymond M. Fuoss of the Sterling Chemistry Laboratory, Yale University. Under the title "Electrolytic Conductance-Theory and Practice," Professor Fuoss covered the field from conducting solutions to good insulating liquids. The guest speaker at the Conference banquet was Estil Green, former Executive Vice-President of Bell Telephone Laboratories, Inc., who spoke on "Science and Society."

The following officers were nominated for the 1962 Conference: Philip J. Franklin, Diamond Ordnance Fuze Laboratory, *Chairman*; Joseph Sticher, Detroit Edison Company, *Vice Chairman*; and Louis J.

Frisco, Johns Hopkins University, *Secretary*.

The Conference selected the Hershey Hotel, Hershey, Pa., as the place for the 1962 annual meeting and October 15-17 as the date. It was voted to hold the 1963 annual meeting at White Sulphur Springs, W. Va., November 4-6.

The Proceedings of the 30th annual meeting will be published in February 1962 and will be available from the Printing and Publishing Office of the Academy-Research Council.

CONFERENCE ON ORGANIC SULFUR COMPOUNDS

The Fifth Organic Chemistry Conference on Organic Sulfur Compounds, sponsored by the Committee on Pioneering Research of the Advisory Board on Quartermaster Research and Development, was held at the Quartermaster Research and Engineering Center, Natick, Mass., on October 12 and 13. Over 200 scientists attended to hear and discuss the following seven formal presentations:

- 1) Nuclear Magnetic Resonance and Oxidation Studies on Thiols, D. Stanley Tarbell, University of Rochester
- 2) Protection Against Ionizing Radiation by Organic Sulfur Compounds, David G. Doherty, Oak Ridge National Laboratory.
- 3) Some Recent Developments in Organosulfur Chemistry, Irwin B. Douglass, University of Maine
- 4) The Scission of the Sulfur-Sulfur Bond, Norman Kharasch, University of Southern California
- 5) Sulfur-Catalyzed Isomerization of Ketones, Marvin Carmack, Indiana University
- 6) Synthesis and Transformation of Sulfur-Containing Carbohydrates, Bernard R. Baker, University of Buffalo
- 7) Stereochemistry of Addition to C=C Bonds, Frederick G. Bordwell, Northwestern University

Artturi I. Virtanen, President of the Finnish National Academy of Arts and Sciences and recipient of the Nobel Prize in chemistry in 1945, was guest of honor at the dinner at which he spoke on organic sulfur compounds in vegetables and their importance in human nutrition.

AWARDS IN RADIOLOGICAL RESEARCH

On behalf of the James Picker Foundation, the Academy-Research Council has announced the award of 25 grants and fellowships in the field of radiology and nuclear medicine. These awards, totaling approximately \$150,000, have been approved by the Foundation on recommendation of the Committee on Radiology of the Academy-Research Council.

The Picker Foundation, with the advice and cooperation of the Committee, initiated its program of research grants and fellowships in 1950 and during the past year expanded it to include a new series of Advanced Fellowships in Academic Radiology, in recognition of the increasing interest of the Foundation in the advancement of medical education. The first three of these Advanced Fellowships have been awarded for the academic year 1961-62.

At the same time, the National Research Council of Canada, which has served as scientific adviser to the James Picker Foundation with respect to its Canadian program, has announced the award of two research grants for the coming academic year.

The names of the recipients and the nature and location of their research are given below under the type of award granted.

Research Grants:

Sven Bellman, Karolinska Institutet, Stockholm, Sweden

Continuation of his investigations of the local vascular response to radiation injury.

John R. Cameron, University of Wisconsin Medical School

Measurement of bone densities *in vivo*, using radioactive sources.

John A. Campbell and Eugene C. Klatte, Indiana University School of Medicine

Continuation of their comparative studies on the relative diagnostic image quality resulting from the use of film of various sizes in cineradiography.

P. Czerniak, Radium and Isotope Institute, Tel-Hashomer Government Hospital, Tel-Hashomer, Israel

Continued research on human spermatogenesis using radioactive phosphorus (P^{32}).

F. Dalith, Tel-Hashomer Government Hospital

Continuation of his studies on tomographic features in cardiovascular disorders.

Robert A. Evans, Stanford University School of Medicine

Research involving quantitative measurements of cerebral blood flow in the macaque monkey.

Samuel S. Kurohara, Strong Memorial Hospital, University of Rochester School of Medicine

Studies on radiation sickness and post-irradiation creatinuria in patients undergoing radiation therapy.

Hilde Levi, University of Copenhagen, Denmark

Application of quantitative high resolution autoradiography to biological problems.

Gwilym S. Lodwick and Theodore E. Keats, University of Missouri Medical Center

Continuation of their studies on the vascular and osseous changes occurring in hypertrophic pulmonary osteoarthropathy.

Carl-Olof Ovenfors, Karolinska Institutet, Stockholm, Sweden

Radiological study of changes in the lungs after increased intrabronchial pressure.

Robert C. Schlant and Wade H. Shuford, Emory University School of Medicine

Continued research on the use of wedge angiography in the evaluation of pulmonary and hepatic vascular disease.

Theodore A. Tristan, University of Pennsylvania Hospital

Development of improved methods of cine-fluorographic analysis of genito-urinary tract function.

James E. Turner, Northwestern University Medical School

Development of a rapid pre-calculated dosage system for 200 KV arc therapy providing water-equivalent tissue doses for the entire plane of rotation.

Sidney Wallace and Philip J. Hodes, Jefferson Medical College Hospital

Studies on lymphangiography, a radiographic technique for the study of lymphatics and lymph nodes in various diseases.

Mark H. Wholey, Charleston Memorial Hospital, Charleston, W. Va.

Continued research on the use of inhalation radiocardiography in the diagnosis of left-to-right intracardiac shunts.

Grants for Scholars:

Kurt R. Straube, Continuation of his studies on occlusion arteriography by a single lumen balloon catheter and of his studies on visceral arteriography—University of Oregon Medical School, in the laboratory of Charles T. Dotter.

Manuel Viamonte, Jr., Research on the usefulness of biplane cinefluorography in visualizing the perfusion of occluded coronary arteries with fibrinolytic substances—University of Miami School of Medicine, in the laboratory of Raymond E. Parks.

Research Fellowships:

Harry A. Bishop, Evaluation of coronary circulation by means of external scintillation counting—University of California Medical Center at Los Angeles, under the guidance of L. R. Bennett and M. A. Greenfield.

Takashi Honda, Study of the medical uses of isotopes—Oak Ridge Institute of Nuclear Studies, under the guidance of Granvil C. Kyker.

Ugo Meldolesi, Cineradiological study of the blood circulation in the lungs, brain, and kidneys—University of Rochester School of Medicine, under the guidance of Frank L. Campeti.

Rogelio M. Moncada, Continuation of his study of myocardial contractility—Cook County Children's Hospital, Chicago, under the guidance of Benjamin M. Gasul.

Wang Yen, Continuation of his *in vitro* studies of thyroid function with radioactive iodine—Jefferson Medical College in Philadelphia, under the guidance of Simon Kramer.

Advanced Academic Fellowships:

Jacob I. Fabrikant, Studies on the biological effects of radiation—Royal Cancer Hospital, University of London, England, under the guidance of W. V. Mayneord and L. F. Lamerton.

Yosh Maruyama, Studies on mammalian cellular radiobiology and laboratory research on the chemical modification of radiation effects—Stanford Medical Center, under the guidance of Henry S. Kaplan.

Joseph E. Whitley, Studies in cardiovascular physiology—Karolinska Institutet, Stockholm, Sweden, under the guidance of Torgny Sjostrand, Ulf Ruhde, and Clarence Crafoord. Dr. Whitley will return to Massachusetts Institute of Technology after 6 months for studies in electrical instrumentation in biology, under the guidance of Francis O. Schmitt, John G. Trump, and Kurt S. Lion.

COMMITTEE ON BASIC RESEARCH ADVISORY TO U. S. ARMY RESEARCH OFFICE

The Committee on Basic Research Advisory to the U. S. Army Research Office (Durham), (AROD) was established in 1961 as an outgrowth of the Committee Advisory to the Office of Ordnance Research (OOR), which was formed in 1951. The purpose of the new committee is to evaluate the scientific merits of basic research proposals received by AROD. To provide an intimate acquaintance with the status of research in the diversified subfields of each of the divisions represented (chemistry, engineering, mathematics, and physics) would require an extremely large committee. As an alternative in attaining this objective, the committee asks, in the case of each proposal, for the advice of several referees who have knowledge of the special field of that proposal. The reports from these referees are used by the committeemen as a basis for preparing their evaluations for AROD. With a revolving committee new referees are constantly being assigned and, therefore, no one specialist is

called upon to appraise any large number of proposals.

A joint meeting of the committee and the scientific staff of the U. S. Army Research Office (Durham) was held in Durham, N. C., on March 10, 1961. Col. George W. Taylor, Commanding Officer, explained the transfer of OOR to AROD and outlined the current organization and operations. John S. Dawson, Chief Scientist, reviewed the current funding in the various divisions and briefed the committee men on AROD policies. At the afternoon session of the meeting, committee procedures and policies were discussed at length.

R. E. Gibson, Director of the Applied Physics Laboratory of Johns Hopkins University, is the current chairman of the committee. Dr. Gibson was appointed in 1958 and has directed the committee through its transition from OOR to its present status as Advisory Committee to AROD. The first chairman of the Committee Advisory to OOR in basic research was R. C. Gibbs, who served from 1951–56. Dr. Gibbs was formerly Chairman of the Department of Physics of Cornell University from 1934–46 and served as Chairman of the Academy-Research Council's Division of Physical Sciences from 1946–53. Paul D. Foote, a member of the Academy, was the next chairman, serving from 1956–57. Dr. Foote was formerly Vice President and Director of Research for the Gulf Oil Corporation and in 1958 retired as Assistant Secretary of Defense (Research and Engineering).

The following list shows the present membership of the Advisory Committee and the subfields arranged by division:

Chemistry:

BARNETT DODGE, Yale University, Chemical engineering

JOHN D. FERRY, University of Wisconsin, High polymers

HENRY S. FRANK, University of Pittsburgh, Physical chemistry

ELLIS R. LIPPINCOTT, University of Maryland, Theoretical chemistry

JOHN L. MARGRAVE, University of Wisconsin, Inorganic chemistry

RICHARD M. NOYES, University of Oregon, Physical chemistry

E. F. OSBORN, Pennsylvania State University, Ceramic sciences

GLEN A. RUSSELL, Iowa State University, Organic chemistry

HAROLD R. SNYDER, University of Illinois, Organic chemistry
JOHN H. YOE, University of Virginia, Analytical chemistry

Engineering and Metallurgy:

PAUL A. BECK, University of Illinois, Physical metallurgy
ERNEST F. BRATER, University of Michigan, Fluid mechanics
RENATO CONTINI, New York University, Human engineering
ERNST R. G. ECKERT, University of Minnesota, Thermodynamics and heat transfer
ANTONIO FERRI, Polytechnic Institute of Brooklyn, Fluid dynamics
A. M. GAUDIN, Massachusetts Institute of Technology, Process metallurgy
EMMERICUS C. W. A. GUEZE, Rensselaer Polytechnic Institute, Soil mechanics
WM. R. OSGOOD, Catholic University of America, Mechanics
WILLIAM PRAGER, Brown University, Dynamics of continuous media
THOMAS A. READ, University of Illinois, Materials and structures
EDWARD SAIBEL, Rensselaer Polytechnic Institute, Friction lubrication
E. E. SECHLER, California Institute of Technology, Materials and structures
SAMUEL SEELY, National Science Foundation, Electrical engineering and acoustics

Mathematics:

WM. G. COCHRAN, Harvard University, Statistics and probability
GEORGE E. FORSYTHE, Stanford University, Applied mathematics and numerical analysis
W. S. MASSEY, Yale University, Topology and geometry
CHARLES B. MORREY, JR., University of California at Berkeley, Classical analysis
D. C. SPENCER, Princeton University, Abstract analysis
JOHN T. TATE, Harvard University, Algebra, theory of numbers and foundations
ROBERT M. THRALL, University of Michigan, Operations research

Physics:

ROBERT K. ADAIR, Brookhaven National Laboratory, Nuclear physics
W. P. ALLIS, Massachusetts Institute of Technology, Gaseous electronic phenomena
H. C. DEHMELT, University of Washington, Optics and other miscellaneous fields
H. Y. FAN, Purdue University, Solid state physics
S. N. FONER, Johns Hopkins University, Atomic and molecular physics
C. K. JEN, Johns Hopkins University, Microwaves
JAMES A. KRUMHANSL, Cornell University, Solid state physics
HARDEN M. MCCONNELL, California Institute of Technology, Chemical physics
ALBERT WATTENBERG, University of Illinois, Nuclear physics

POSTDOCTORAL RESIDENT RESEARCH ASSOCIATESHIPS

The Academy-Research Council has announced the 1962-63 program of postdoctoral resident research associateships, supported by several agencies of the Federal Government. These appointments for research in basic and applied sciences are tenable at the following laboratories or research centers:

NATIONAL BUREAU OF STANDARDS, Washington, D. C., and Boulder, Colo.
NAVAL ORDNANCE LABORATORY, White Oak, Silver Spring, Md.
NAVAL RESEARCH LABORATORY, Washington, D. C.
NAVAL WEAPONS LABORATORY, Dahlgren, Va.
NAVY ELECTRONICS LABORATORY, San Diego, Calif.
U. S. ARMY CHEMICAL CORPS BIOLOGICAL LABORATORIES, Fort Detrick, Frederick, Md.

In addition four technical centers of the U. S. Air Force Systems Command and the Office of Aerospace Research and eight pioneering research laboratories of the U. S. Agricultural Research Service are also participating in this program.

Applications are available from the Fellowship Office of the Academy-Research Council and must be filed no later than February 1, 1962. Awards will be announced by the participating laboratory on or about April 1, 1962.

INTERNATIONAL FIELD INSTITUTE FOR COLLEGE GEOLOGY TEACHERS

An International Field Institute for United States college and university teachers of geology will be conducted in the Alps by the American Geological Institute (AGI) under a grant from the National Science Foundation during the summer of 1962. The objective of this 8-week summer field program will be to provide an opportunity for a selected group of college teachers to study classic geologic features of the Alps of Switzerland and adjacent areas of France, Italy, and Austria in the field under the leadership of widely recognized Swiss research scientists.

The program will be under the joint leadership of one United States and two Swiss geologists: Augusto Gansser, Federal Technical Institute, Zurich; Augustin Lombard, University of Geneva; and D. L. Blackstone, Jr., University of Wyoming.

Serving as field leaders for various portions of the program will be:

HELI BADOUX, University of Lausanne
RENÉ HERB, Geological Institute, Zurich
RUDOLPH TRUMPFY, Swiss Institute of Technology
and University of Zurich
MARC B. VUAGNAT, University of Lausanne
EUGENE WEGMANN, University of Neuchatel

Twenty participants will be selected from the field of applicants by a special AGI Selection Committee and will receive travel and subsistence allowances. Application forms and announcement brochures have been mailed to all 4-year colleges and universities offering geology.

Applications must be filed on or before February 1, 1962, and should be addressed to Professor D. L. Blackstone, Jr., Department of Geology, University of Wyoming, Laramie, Wyo. The awards will be announced not later than March 15, 1962.

POSTDOCTORAL RESEARCH FELLOWSHIPS IN THE NATURAL SCIENCES

The Fellowship Office of the Academy-Research Council is administering a program of postdoctoral research fellowships, supported by the U. S. Air Force Office of Scientific Research of the Office of Aerospace Research. The program has been established to provide young investigators of superior ability with opportunities for advanced study and fundamental research in the various branches of the natural and applied sciences. Fellows will be selected by a Board appointed by the Academy-Research Council.

These fellowships are open only to citizens of the United States and are tenable at appropriate educational institutions and research laboratories in the United States and abroad. Applicants must have training in one of the natural or applied sciences equivalent to that represented by the Ph.D. or Sc.D. degree and must have completed all of the academic requirements of one of these degrees upon entering the fellowship.

Applications for the academic year 1962-63 should be filed on or before January 12, 1962, and awards will be made on or about April 1, 1962. Requests for application blanks or for additional information should be addressed to the Fellowship Office of the Academy-Research Council.

INTERNATIONAL SPACE SCIENCE SYMPOSIUM

The Committee on Space Research (COSPAR), established by the International Council of Scientific Unions, is organizing the Third International Space Science Symposium to be held in Washington, D. C., May 1-3, 7 and 8, 1962. The symposium will comprise the following sessions: I—Upper Atmosphere and Exosphere of the Earth and Relationship to Solar Disturbances; II—The Sun and the Interplanetary Medium; III—The Moon and the Planets; IV—Galactic and Extra-Galactic Astronomy; V—Life Sciences; and VI—Technologies of Space Research.

Sessions I to V will include one or more theoretical or review papers by invited contributors plus original individual contributions describing new experimental or analytical results. It is suggested that Session VI be an open meeting of COSPAR's Working Group 1 on Tracking and Telemetry. In addition, a number of evening lectures will be devoted to selected topics in space research.

A Second Circular will be issued in February giving further details of the scientific program and arrangements for the meetings. All inquiries regarding participation, presentation of papers, and travel support should be addressed to the COSPAR Secretariat, 28 Nieuwe Schoolstraat, The Hague, The Netherlands.

Preceding the symposium, there will be two related symposia also in Washington—1) "Meteorological Uses of Rockets and Satellites," to be held April 23-25, and 2) "Use of Artificial Satellites for Geodesy," April 26-28. The first is being organized jointly by the World Meteorological Organization (WMO), the International Union of Geodesy and Geophysics (IUGG), and COSPAR. The topics to be discussed are: design and performance of rockets; telemetry; description of specific programs and results; cloud cover experiments; reduction, interpretation, and use of data; and possibilities for future consideration. The second is being organized by the International Association of Geodesy (IAG) and COSPAR. The program will cover studies in geodesy as they relate to the satellite program:

dynamic and geometric application; orbital problems of celestial mechanics, observational programs for optical and radio tracking; international participation; and data reduction. Further information about both of these symposia may be obtained from the COSPAR Secretariat (see address given above).

GRADUATE AND POSTDOCTORAL INTERNATIONAL FELLOWSHIPS IN SPACE SCIENCE

The National Aeronautics and Space Administration (NASA) has announced a program of graduate and postdoctoral international fellowships in space science for 1961-63 to be administered by the Fellowship Office of the Academy-Research Council. Its purpose is to assist regional and national space research organizations abroad to develop scientists and technicians for their space research programs, trained in such subjects as astronomy, astrophysics, fields and particles, meteorology, planetary science, plasma physics, solar physics, and space biology as studied by means of satellites and sounding rockets.

The fellowships are open only to foreign nationals sponsored by their National or Regional Space Research Organizations or, where such organizations have not been established, by their National Research Councils. Applications should be made to the appropriate organization in the applicant's country of origin. The sponsoring organization will submit the application with its recommendation to the Fellowship Office for evaluation. The tenure of the fellowship will be for one year; however, applications for renewal will be considered, as will tenures up to two years.

Requests for application forms and additional information should be addressed to the Fellowship Office, Academy-Research Council.

EXPANSION OF ENVIRONMENTAL EFFECTS ON MATERIALS AND EQUIPMENT

Beginning in January 1962, Volume II of *Environmental Effects on Materials and Equipment* will be expanded to include abstracts relating the earth's natural environ-

ments to materials and equipment. This information has been published by the Prevention of Deterioration Center since 1946 in the *Prevention of Deterioration Abstracts*. The two serials are being combined to improve services to those offices, Laboratories, and personnel concerned with materials and equipment problems in degradative environments.

Using the same format, *Environmental Effects on Materials and Equipment* will be published in two separate bound pamphlet sections. Section A will contain 80 or more abstracts, plus 60-80 extracts, on the environmental factors, their effects on materials and equipment, materials resistance, corrective or preventive measures, and test methods in which chemical, physical, and biological factors predominate. This section will be distributed the first of each month.

Section B will contain 40 or more abstracts, plus 40 or more extracts, in which physical and engineering considerations predominate; and will be distributed the middle of each month.

The two sections will be available separately and in combination. Subscription rates per year are Section A, \$50; and Section B, \$25. Orders should be sent to the Printing and Publishing Office of the Academy-Research Council.

STAFF APPOINTMENTS

Ross D. Netherton has joined the technical staff of the Highway Research Board as Counsel for Legal Research. He will participate in all of the activities of the Highway Research Correlation Service, giving that service an expanded coverage to include research on legal subjects. He will also serve as a staff member of the Special Committee on Highway Laws.

Mr. Netherton came to Washington, D. C., in 1950 to join the faculty of American University's Washington College of Law. In 1951 he accepted the position of Legislative Counsel for the American Automobile Association, and in 1960 he became a Research Fellow at the University of Wisconsin Law School. Under a research grant sponsored jointly by the University of Wisconsin and the U. S. Bureau of Public

Roads, he worked until September 1961 on a study of the legal and economic aspects of controlling highway access.

Adrian G. Clary, formerly with the Wyoming Highway Department as District Maintenance Engineer at Basin, has joined the Highway Research Board as Staff Engineer for Maintenance and Equipment. Mr. Clary graduated from the University of Wyoming with a B.S. degree in Civil engineering in 1949 and subsequently spent 12 and a half years with the Wyoming Highway Department.

Ruurd van Lieshout, a deputy director of the Instituut voor Kernfysisch Onderzoek at Amsterdam and formerly a Professional Associate on the staff of the Nuclear Data Project, has returned to spend an additional six months with the Data Project group. While here, Dr. Van Lieshout will organize meetings between the project staff and physicists active in particular fields of special interest.

In addition, **Agda Artna** and **Margaret Waggoner** have also been added to the staff of the Nuclear Data Project this fall. Dr. Artna recently received her Ph.D. degree from McMaster University in Hamilton, Ont. Dr. Waggoner holds a Ph.D. degree from the State University of Iowa and has served on the physics staffs of Vassar College and Stanford University. At present she will spend only half of her time on the Data Project, the remainder will be devoted to teaching and research at the University of Maryland.

The Division of Medical Sciences announced the appointment of **Francis J. Weber** as a Professional Associate, effective

November 15. Dr. Weber received his M.D. degree from the University of Pennsylvania in 1936 and subsequently earned the degrees of Master and Doctor of Public Health from Johns Hopkins University. From 1938 until his retirement in 1961, he served with the U. S. Public Health Service, holding such positions as Regional Medical Director for the Cleveland and Denver offices, Chief of the Division of Tuberculosis Control, and Chief of the Division of Radiological Health. His duties within the Division will be concerned with the work of the Atomic Bomb Casualty Commission and activities in the field of environmental health.

Herbert N. Gardner, a Professional Associate in the Division of Medical Sciences since 1948, has been designated Assistant to the Chairman. In addition to his new duties, he will retain responsibility for the international activities of the Division.

William L. Petrie has been appointed Executive Secretary of the Amsoc Committee to coordinate and facilitate the work on Project Mohole with the Committee, its panels, the technical staff, and the still-to-be-selected prime contractor. Mr. Petrie received his M.S. degree in geology from the State University of Iowa in 1951. Before coming to the Academy-Research Council he served as geologist, geophysicist, and oceanographer in several government positions in and around Washington. He was Panel Coordinator on the staff of the Committee on Geophysics and Geography under the Office of the Assistant Secretary of Defense and an oceanographer at the U. S. Navy Hydrographic Office.

RECORD OF MEETINGS

September

- 2-3 Committee on Shock
- 5-6 Committee on Natural Resources
- 6 Building Research Advisory Board,
Executive Committee
Committee on Macromolecular Chemistry, *Chicago*
- 7 Roundtable on Fire Protection of
Buildings and Fire Safety to Life
Refractory Metals Sheet Rolling Panel,
Subpanel on Coating
Federal Construction Council, Task
Group T-45 on Boilers

September

- 9 Ad hoc Committee on Survey of Polymer Chemistry, *Madison, Wis.*
- 11-12 Refractory Metals Sheet Rolling Panel,
Subpanel on Quality Specifications
National Advisory Committee for AASHO Road Test, *Chicago*
- 12 Committee on Ship Structural Design,
Advisory Committee for Project SR-157, *New York City*
Committee on International Exchange
of Persons, Local Members

September

- 12 Building Research Institute, Roundtable on Pumped and Sprayed Application of Building Material
- 13 Special Committee on Urban Transportation Research, Steering Committee
- 14-15 Conference on Urban Transportation Research
- 15 Building Research Institute, Executive Committee
- 18-19 Refractory Metals Sheet Rolling Panel, *Seattle*
- 19 Federal Construction Council, Operation Committee
Planning Committee on Paints and Coatings in Building
- 20 Building Research Institute, Division IV Programs Committee
- 21 Committee on Sanitary Engineering and Environment
- 21-22 Highway Research Board, Department of Soils, Geology and Foundations, *Chicago*
Federal Housing Administration, Technical Studies Advisory Committee
Review of Department of Defense Materials Research and Development, Committee 6
- 22 Building Research Institute, Division I Programs Committee, *Ann Arbor, Mich.*
- 23 U. S. National Committee, International Union of Biochemistry, *New York City*
- 25 Highway Research Board Executive Committee, Steering Committee
Planning Committee on Adhesives and Sealants, *New York City*
- 26 Scientific Information Group
- 27 Committee on Ship Steel, Advisory Committee for Project SR-136, *Cambridge, Mass.*
Ad hoc Textile Research Committee
Division of Engineering and Industrial Research, Executive Committee
- 27-28 Review of Department of Defense Materials Research and Development, Steering Committee
Building Research Advisory Board, Special Advisory Committee to the National Bureau of Standards
- 28 Committee on Ship Steel, *Cambridge, Mass.*
Advisory Committee on Design Criteria for Refrigerated Storage Installations and Insulation Research Needs, *Williamsburg, Va.*
- 29 Committee on Radio-Frequency Allocations for Scientific Research
- 30 Committees to Evaluate National Science Foundation Postdoctoral Fellowships

October

- 1 National Science Foundation Postdoctoral Fellowship Board
Committee on Photobiology
- 2 Building Research Institute, Programs Steering Committee
- 3 Building Research Institute, Programs Committee on Fire Research
- 4 Ad hoc Committee on the Role of Patents in Research
Committee on Ship Steel, Advisory Committee for Project SR-162, *Bethlehem, Pa.*
- 4 Institute of Laboratory Animal Resources, Executive Committee
Advisory Committee to U. S. Coast and Geodetic Survey
- 5 Committee on Shock
Committee on Ship Structural Design, *New York City*
Committee on Electronics
- 5-6 Advisory Committee on Civil Defense, Subcommittee on Protective Structures
Committee on Climatology, Advisory to the U. S. Weather Bureau, *Suitland, Md.*
- 6 Committee on Ship Structural Design, Advisory Committee for Project SR-161, *New York City*
Office of Documentation, Advisory Committee, *New York City*
Subcommittee on Nuclear Geophysics
Division of Earth Sciences, Executive Committee
Committee on Atmospheric Sciences
Amsoc Committee, Panel on Scientific Objectives and Measurements and Panel on Site Selection, Joint Meeting
- 7 National Academy of Sciences, Council
- 8 Committee on Environmental Biology
National Academy of Sciences-National Research Council, Governing Board
- 10-11 Titanium Alloy Sheet Rolling Committee
- 11 Committee on Oceanography
- 12 Committee on Laboratory Animal Transportation, *Maywood, N. J.*
- 12-13 Fifth Organic Chemistry Conference on Organic Sulfur Compounds, *Natick, Mass.*
- 13 Committee on Shock
- 13-14 Ad hoc Committee on Nomenclature of Steroid Compounds, *Columbus, Ohio*
- 14 Committee on Blood and Related Problems
Division of Mathematics, Travel Grants Subcommittee
Organizing Committee for XVI International Zoological Congress, Executive Committee

October

- 15 Organizing Committee for XVI International Zoological Congress
- 15-17 Agricultural Research Institute
- 16 Latin American Science Education Group
- 16-17 Aerospace Manufacturing Techniques Panel, *Los Angeles*
Committee on Highway Capacity, *New York City*
Food Protection Committee and Industry Committee, *Gatlinburg, Tenn.*
- 16-18 Tenth Annual Conference on Clays and Clay Minerals, *Austin, Tex.*
- 17 Subcommittee on Nuclear Geophysics
Committee on International Exchange of Persons
Planning Committee on Plastics in Building, *Princeton, N. J.*
- 18 Institute of Laboratory Animal Resources, Advisory Council
Building Research Institute, Division VI Programs Committee, *New York City*
Building Research Advisory Board, Conference on Federal Products Center
- 19 Committee on Elastomers, *Natick, Mass.*
Advisory Panel on Food Chemicals Codex
Ad hoc Committee on Microbiological Standards for Poultry
- 20 Federal Construction Council, Task Group T-29 on Thermal Insulation for Piping
- 21 Subcommittee on Thrombosis and Hemorrhage
Advisory Committee on Scientific Exchanges with the Soviet Union

October

- 22 Review of Department of Defense Materials Research and Development, Committee 2, *Detroit*
- 23 Committee on Sanitary Engineering and Environment
- 24 Federal Construction Council, Task Group T-45 on Boilers
- 24-25 Committee on Natural Resources
- 26 Review of Department of Defense Materials Research and Development, Committee 5, *Dearborn, Mich.*
Scientific Information Group
Advisory Committee on Civil Defense
Building Research Institute, Finance Committee, *Dallas*
Institute of Laboratory Animal Resources, Committee on Quarantine Facilities
Subcommittee on Radiobiology
U. S. National Committee, International Union of Physiological Sciences
- 28 Amsoc Committee, Panel on Drilling Techniques, *Dallas*
Committee on Soils-Calcium Chloride Roads, *Healing Spring, Va.*
National Science Foundation Senior Postdoctoral Fellowship Committees
- 29 National Science Foundation Senior Postdoctoral Fellowship Board
- 30 Committee on Pest Control and Wildlife Relationships, *Madison, Wis.*
- 31 Committee on International Exchange of Persons
Ad hoc Committee on Engineering and Social Sciences
Committee on Development of Manufacturing Methods for Aircraft Materials
Desalination Research Conference, Editorial Committee, *Boston*

NEW PUBLICATIONS

- Armed Forces-NRC Committee on Bio-Astronautics. Panel Acceleration Stress. *Human Acceleration Studies*. Washington, 1961. (NAS-NRC Publication 913.) 71 p., illus.
- Cheronis, Nicholas D., ed. *Submicrogram Experimentation. Based on a Symposium Sponsored by the National Academy of Sciences and the National Research Council, Arlington, Va., May 15, 1960*. New York, Interscience Publishers, 1961. 351 p. Paper, \$10.75; cloth, \$12.75.
- Gaus, M. P. *A Numerical Solution for the Transient Strain Distribution in a Rectangular Plate with a Propagating Crack*. Washington, NAS-NRC, 1961. (Ship Structure Committee. Serial No. SSC-129.) 78 p.

- Hall, W. J., et al. *Brittle-Fracture Propagation in Wide Steel Plates*. Washington, NAS-NRC, 1961. (Ship Structure Committee. Serial No. SSC-131.) 30 p.
- National Academy of Sciences. Committee on Oceanography. *A Special Report: A Review of Oceanography, 1960-1970, and Comments on the Oceanography Fiscal Year 1962 Program*. Washington, NAS-NRC, 1961. 46 p.
- National Research Council. Agricultural Board. *Publications of the Agricultural Board*. Washington, NAS-NRC, 1961. [Unpaged.]
- National Research Council. Building Research Advisory Board. *Residential Building Sewers*. Washington, 1961. (NAS-NRC Publication 787.

- Report No. 16 to Federal Housing Administration.) 126 p. \$2.00.
- National Research Council. Highway Research Board. *Developments in Salvaging Old Pavements by Resurfacing*, 1961. Washington, 1961. (NAS-NRC Publication 862. Highway Research Board Bulletin 290.) 52 p. \$1.20.
- National Research Council. Highway Research Board. *Drainage Structures Design and Performance*. Washington, 1961. (NAS-NRC Publication 856. Highway Research Board Bulletin 286.) 31 p. \$1.00.
- National Research Council. Highway Research Board. *Driver Personality and Behavior Characteristics*. Washington, 1961. (NAS-NRC Publication 855. Highway Research Board Bulletin 285.) 34 p. \$1.00.
- National Research Council. Highway Research Board. *Flexible Pavement Design Developments*, 1961. Washington, 1961. (NAS-NRC Publication 861. Highway Research Board Bulletin 289.) 90 p. \$2.00.
- National Research Council. Highway Research Board. *Freeway Design and Operations*. Washington, 1961. (NAS-NRC Publication 866. Highway Research Board Bulletin 291.) 206 p. \$4.00.
- National Research Council. Highway Research Board. *In Commemoration of the 40th Annual Meeting, Highway Research Board*. Washington, 1961. (NAS-NRC Publication 864. Highway Research Board Special Report 63.) 28 p. \$0.80.
- National Research Council. Highway Research Board. *Influence of Stabilizers on Properties of Soils and Soil-Aggregate Mixtures*. Washington, 1961. (NAS-NRC Publication 852. Highway Research Board Bulletin 282.) 159 p. \$3.40.
- National Research Council. Highway Research Board. *Land Use and Development at Highway Interchanges*. Washington, 1961. (NAS-NRC Publication 860. Highway Research Board Bulletin 288.) 82 p. \$1.80.
- National Research Council. Highway Research Board. *Photogrammetry. Developments and Applications 1960*. Washington, 1961. (NAS-NRC Publication 853. Highway Research Board Bulletin 283.) 64 p. \$1.60.
- National Research Council. Highway Research Board. *Traffic Engineering: A Legal Analysis*. Washington, 1961. (NAS-NRC Publication 865. Highway Research Board Special Report 64.) 66 p. \$2.40.
- National Research Council. Highway Research Board. *Traffic Volume and Speed Studies*. Washington, 1961. (NAS-NRC Publication 851. Highway Research Board Bulletin 281.) 96 p. \$2.00.
- National Research Council. Institute of Laboratory Animal Resources. *Laboratory Animals. II: Animals for Research. A Directory of Commercial Sources of Laboratory Animals and Equipment*. Washington, 1961. (NAS-NRC Publication 907.) 80 p. \$1.50.
- Seeley, Sam F., and Weisiger, James R., eds. *Proceedings of a Conference on Recent Progress and Present Problems in the Field of Shock. Held . . . Washington, D. C., December 14-17, 1960. Sponsored by . . . Division of Medical Sciences, National Academy of Sciences-National Research Council*. Washington, NAS-NRC, 1961. [Reprinted from Federation of American Societies for Experimental Biology, *Federation Proceedings*, July 1961, Supplement No. 9.] 268 p.
- Spitsyn, V. I. *Soviet Chemistry To-Day*. Washington, NAS-NRC, 1961. 302 p. \$2.50.
- Vedeler, Georg. *A Naval Architect's Reflections on Some Research Problems with Ship Steel*. Washington, NAS-NRC, 1961. (Ship Structure Committee. Serial No. SSC-140.) 16 p.
- Vedeler, Georg. *On Various Problems of Immediate Interest to a Ship Classification Man*. Washington, NAS-NRC, 1961. (Ship Structure Committee. Serial No. SSC-136.) 19 p.
- Yao, J. T. P. *Low Cycle Fatigue of Metals—A Survey*. Washington, NAS-NRC, 1961. (Ship Structure Committee. Serial No. SSC-137.) 35 p.

Notice of Academy Meetings

NATIONAL ACADEMY OF SCIENCES

Annual Meeting, Washington, D. C., April 23-25, 1962

NATIONAL RESEARCH COUNCIL

Annual Meeting, Washington, D. C., April 1-3, 1962

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL

Governing Board, Washington, D. C., February 11, 1962

Governing Board, Washington, D. C., April 1, 1962

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*The search for Truth is in one way hard
and in another easy. For it is evident that no one
can master it fully nor miss it wholly. But each adds
a little to our knowledge of Nature, and from all
the facts assembled there arises a certain grandeur.*

—ARISTOTLE

